



**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY**  
**SCHOOL OF HEALTH SCIENCES**  
**UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR PUBLIC HEALTH**  
**AND COMMUNITY HEALTH AND DEVELOPMENT**  
**4<sup>TH</sup> YEAR 1<sup>ST</sup> SEMESTER 2022/2023 ACADEMIC YEAR**  
**MAIN CAMPUS**

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**COURSE CODE: HCB 1415**

**COURSE TITLE: CLIMATE CHANGE AND HEALTH**

**DATE:**

**TIME: 9.00-12.00 NOON**

**TIME: 2 HOURS**

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**Instructions:**

1. Answer ALL questions in Section A and B and ANY other TWO questions in Section C
2. Tick the most correct alternative in Section A
3. Answers to Questions in Section B and C must be written in the spaces provided on the question paper.
4. Candidates must ensure they submit their work by clicking “finish and submit attempt” button at the end.



Registration No.....

**SECTION A: 20 Marks (Each question carries 1 mark)**

***NB: These are multiple choice questions with four choices, A, B, C, and D and the candidate is supposed to tick the correct answer.***

1. Which of the following is not a green-house gas? *[1 mark]*
  - a) CH<sub>4</sub>
  - b) Stratospheric O<sub>3</sub>
  - c) CO<sub>2</sub>
  - d) NO<sub>x</sub>
2. Which on the following in not considered as a main driver of climate change? *[1 mark]*
  - a) GHGs
  - b) Changes in land use
  - c) Population increase
  - d) Agricultural irrigation
3. Which group below is least affected by extreme heat events from climate change. *[1 mark]*
  - a) Urban dwellers
  - b) Vulnerable populations
  - c) Some occupational workers in Africa
  - d) Pastoralist community
4. Ocean acidification causes the following except one, which one is it. *[1 mark]*
  - a) Increase in ocean pH
  - b) Affects marine nutrients cycling
  - c) Morphological effects to calciferous organisms
  - d) Shift the competitive advantage among species
5. One of the following is not a contributor to poor air quality from climate change. *[1 mark]*
  - a) PM
  - b) Ozone
  - c) NO<sub>x</sub>
  - d) Atmospheric aerosols
6. Climate change results in poor water quality which causes the following except one. *[1 mark]*
  - a) Enhance eutrophication
  - b) Diarrhoeal diseases
  - c) Increased water hardness
  - d) Increase vector-borne diseases
7. The vulnerable populations are affected by climate change through various determinants except. *[1 mark]*
  - a) Exposure
  - b) Occupation hazard
  - c) Sensitivity



Registration No.....

- d) Adaptive capacity
8. Which one the following is not a characteristic of a good environmental health indicator: **[1 mark]**
- a) Scientifically valid and credible
  - b) Clear relevance and utility
  - c) Practical
  - d) Integration and dualism
9. Which one of the following is not desired feature of climate and health framework? **[1 mark]**
- a) Usability
  - b) Flexibles
  - c) Clarity
  - d) Balanced
10. What does DPSEEA stand for in terms of climate change frameworks? **[1 mark]**
- a) Driving forces, pressures, state, exposure, effect and action
  - b) Drivers forces, pressures, state, exposed-effects, and action
  - c) Driving forces, pressures, state, effect, exposure, and action
  - d) Driving forces, pressures, state, exposure, effort and action
11. One of the following is not component of an early warning system. **[1 mark]**
- a) Data collection
  - b) Research
  - c) Dissemination of information
  - d) Response
12. Which one of the following is not considered as a short-lived climate pollutant? **[1 mark]**
- a) CH<sub>4</sub>
  - b) CFCs
  - c) Black carbon
  - d) O<sub>3</sub>
13. Reducing global levels of SLCP will have help achieve the following except? **[1 mark]**
- a) Reduce see level rise
  - b) Improve the general public health outcomes
  - c) Reduce the rate of global warming
  - d) Significantly reduce climate related premature deaths
14. Which of the following is not a driver for increase in global temperature. **[1 mark]**
- a) GHGs
  - b) Natural drivers
  - c) Internal variability
  - d) Aerosols
15. Which one of the following best describe the climate change effect on precipitation? **[1 mark]**
- a) Increased intensity, increased frequency, increased monsoon, delayed monsoon
  - b) Increased intensity, decrease frequency, increased monsoon, delayed monsoon
  - c) Increased intensity, increased frequency, decreased monsoon, delayed monsoon
  - d) Decreased intensity, increased frequency, increased monsoon, delayed monsoon
16. Which combination best describe the cause of sea level rise. **[1 mark]**



Registration No.....

- a) Glacial loss, thermal expansion, changes in land-water storage
  - b) Glacial loss, increase global temperature, changes in land-water storage
  - c) Glacial loss, thermal expansion, increased land precipitation
  - d) Glacial regeneration, increase global temperature, increase land precipitation
17. One of the following is not a fundamental objective of the GEF. **[1 mark]**
- a) Promoting innovation and technology transfer for sustainable energy
  - b) Demonstrating mitigation options with systemic impacts
  - c) Mainstreaming mitigation concerns into sustainable development strategies
  - d) Addressing the challenge of climate change given their particular vulnerability
18. UNFCCC treaty called for future policy agreement designed to following except. **[1 mark]**
- a) Allow ecosystems to naturally adapt to climate change
  - b) Enable reduced health risks
  - c) Ensure that food production is not threatened
  - d) Enable economic development to proceed in a sustainable manner
19. Which one of the following is not a COP26 health recommendation for action? **[1 mark]**
- a) Building Climate Resilient Health Systems
  - b) Developing Low Carbon Sustainable Health Systems on a Pathway to Net Zero
  - c) Strong Inclusion of Health in Nationally Determined Contributions
  - d) Health awareness
20. One of the following is not a direct health impact climate change poor air quality. **[1 mark]**
- a) Worsened allergy and asthma conditions
  - b) Adverse chronic and acute cardiovascular respiratory disease
  - c) Hospital admissions
  - d) Premature deaths

### **SECTION B: 30 Marks**

*The candidate is supposed to attempt all questions in this section. Answers to questions in this section must be written in the spaces provided. Answers must be precise and concise.*

*The questions are supposed to be structured/short answer questions which carry 2 to 5 marks each, making a total of 30 marks.*

1. Define climate and differentiate between climate change and climate variability. **[3 marks]**
2. Discuss at least three challenges in the climate change epidemiological studies. **[3 marks]**
3. Explain the role of the following institutions to climate change agenda in Kenya. **[3 marks]**
  - a) National Climate Change Council (NCCC)
  - b) National Climate Change Secretariat (NCCS)
  - c) Climate Change Directorate (CCD)
4. Discuss at least three scenerios that are used to estimate the future effects of climate change and the burden of disease. **[3 marks]**



Registration No.....

5. Discuss at least three main elements of an early warning system in relation to climate change. [3 marks]
6. Explain the methods used to study the current and future effects of poor air quality because of climate change. [3 marks]
7. Explain the following in relation to climate change: [3 marks]
  - a) Mitigation
  - b) Adaptation
  - c) Resilience
8. Briefly describe the roles of the following in climate change agenda. [3 marks]
  - a) UNFCCC
  - b) GEF
  - c) NAPAs
9. Describe the roles of the three categories of parties under the UNFCCC. [3 marks]
10. Briefly define the following terms. [3 marks]
  - a) Epidemiology
  - b) Environmental epidemiology
  - c) Climate change epidemiology

### **SECTION C:20 Marks**

*These are long answer questions.*

*There are a total of three (3) questions, each carrying ten (10) marks. A candidate is supposed to answer any two (2) questions.*

1. Discuss at least five critical environmental changes that are brought about or enhanced by climate change. [10 marks]
2. Discuss at least five direct and indirect health impacts of climate change to a rural agricultural community in the Lake Victoria basin in Kenya. [10 marks]
3. Using the public health essential services, explain and give example of the role of public health in climate change [10 marks]